Heuristic Evaluation method

Our heuristic evaluation function examines all possible combinations of k fields in a row horizontally, vertically, and diagonally. First, we break it down to lines horizontally, vertically and diagonally and evaluate pieces in each line

For example, if the board is 8 x 9 and k is 5, then it would lead to the following possible winning combinations in a horizontal row.

01234567

(0,0)(1,0)(2,0)(3,0)(4,0) (1,0)(2,0)(3,0)(4,0)(5,0) (2,0)(3,0)(4,0)(5,0)(6,0) (3,0)(4,0)(5,0)(6,0)(7,0)

Our evaluation function examines the each of combination taken by each player. It adds each player’s score depending on the number of pieces taken in a row to evaluate how close it is to be k in a row. We gave different weights depending on number of occupied pieces in each block of k. We set AI as MAX player and human as MIN player. So, if AI occupies the fields, then we gave +5 points to AI. If human occupies the fields, then we gave -5 points to human. If the field is empty (nobody occupies the field), then we give points to both player, +3 to AI and -3 to human. And then it counts how many pieces are taken by AI or human, and multiply the number of taken pieces to each player’s score (If AI occupied 2 pieces, and 2 pieces are empty => 16\*2). Finally, if the state is resulted in k in a row, then it would get a big bonus point +1000 or -1000.